

Aethon Energy

Please see attached comments.



July 3, 2019

Wyoming Department of Environmental Quality
Water Quality Division
Mr. Bill DiRienzo, WYPDES Manager
200 W 17th Street, Suite 200
Cheyenne, WY 82002

Re: Comments to Renewal WYPDES Permit WY0002062

Dear Mr. DiRienzo:

Aethon appreciates the opportunity to provide the following comments on the above mentioned draft permit:

- 1) The draft permit adequately satisfies applicable regulations, specifically:
 - a. Wyoming Water Quality Rules and Regulations (WWQRR) Chapters 1 and 2, inclusive of the very important considerations in Appendix H: Additional Requirements Applicable to Produced Water Discharges from Oil and Gas Production Facilities
 - b. Federal regulations contained in Subpart E of 40 CFR § 435 for Effluent Guidelines and Standards for Point Source discharge associated with Oil and Gas Extraction
- 2) The draft permit is more protective and compliance requirements have been significantly increased compared to previous permit authorization for these discharges, specifically:
 - a. the proposed chloride load limit of 719 tons/month is less than chloride loads discharged prior to January 1, 2013
 - b. TDS, chloride, and sulfate have end of pipe concentration limits proposed for all outfalls whereas prior to this renewal, limits for these constituents were not established at the active outfalls
 - c. all discharging outfalls are proposed to have extremely extensive analysis conducted quarterly and several new constituents are in addition to those specified by the WWQRR Chapter 2 permitting application (e.g., BTEX, Thallium, Total Ammonia, Nitrate, Phosphorous, Orthophosphate Phosphorus)
- 3) The Statement of Basis should clearly state that this permit renewal authorizes less untreated discharge and less pollutant load per month than was legally authorized and discharged prior to January 1, 2013.
- 4) Aethon supports establishing Chloride and TDS concentration limits equal to the average untreated historic data such that the water quality being discharged in the future will be equal to or higher quality than has been legally authorized to discharge for decades. The draft permit proposes flow-weighted compliance calculations and Aethon proposes the limits be based on flow-weighted calculations.
 - a. Attachment 1 provides historic DMR data and calculations



- 5) Aethon proposes the following adjustments to the Latitude and Longitude coordinates on Table 1:
 - a. Outfall 016 (to be constructed) should be in accordance with the final pipeline alignment and corresponding location of the proposed stilling well; 43.20953 and -107.55012
 - b. WRC1 monitoring should be conducted at the same location as the Class I baseline sampling that occurred from 2010-2016; 43.433456 and -108.178522
 - c. BWC1 should be consistent with Side ID 9 for the Alkali and Badwater Creek Sampling and Analysis Plan; 43.261799 and -107.675704
- 6) The monthly load limits that utilize Flow Case 01 for calculations are overstated and theoretically unachievable as they assume 68,000 bpd (2.856 MGD) is untreated. Considering chloride is the most limiting constituent and averages 2,419 mg/l, the maximum untreated discharge will be 56,255 bpd (2.36 MGD) which is considerably less than historic volumes that were discharged untreated.
- 7) Aethon proposes toxicity testing for aquatic species be performed at locations in geographic proximity to actual aquatic presence and in correlation with the Use Attainability Analysis on Badwater Creek. Aethon's discharge initially enters Alkali Creek (ephemeral) providing beneficial use for wildlife and livestock. Data collected from Control Reach 2 of Alkali Creek Channel Stability Monitoring (upstream of Aethon's discharge) supports the absence of flowing surface water through years of quarterly monitoring events. As explained in the permit Statement of Basis, Alkali Creek is effluent dominated and is not considered a high class water. The Badwater (perennial) confluence, specifically instream monitoring point BWC1 or the Alkali Downstream Monitoring Point (DMP1) are locations where aquatic toxicity testing would be appropriate considering non-game fish inhabit some segments of Badwater.
- 8) The following excerpts in blue font and underline are proposed revisions to the toxicity testing permit language (acute section comments are a-e and chronic section comments are f-j):
 - a. Upon issuance of this permit, the permittee shall, at least once annually, conduct acute static/static renewal toxicity tests on grab samples of the discharge. The static/static renewal toxicity tests...
 - b. ...as set forth in 40 CFR 136.3 and the most current edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821/R-02-012
 - c. ...an acute 96-hour static renewal toxicity...
 - d. Acute toxicity occurs when the LC₅₀ (defined as the lethal concentration to 50 percent of the test organisms) is equal to or less than 100 percent effluent.
 - e. The format for the report shall be consistent with the most current edition of "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821/R-02-012", and...
 - f. Upon issuance of this permit, the permittee shall, at least once annually, conduct chronic static renewal toxicity tests on a grab samples of the discharge. The static/static renewal toxicity tests...
 - g. ...as set forth in 40 CFR 136.3 and the most current edition of "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821/R-02-013".



- h. Chronic toxicity occurs when the IC₂₅ value (defined as 25 percent inhibition of test organism survival and growth) is equal to or less than 100 percent effluent.
 - i. If a test acceptability criterion is not met for control survival or growth
 - j. The format for the report shall be consistent with the most current edition of "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA-821/R-02-013", and...
- 9) Typographical errors are located on Page 5 under Category I, “The main reason that chloride is the most limiting is because chloride has to overcome the greatest dilution of the parameters, diluting from a 2,000 mg/l...” the value should be 2,419 mg/l. The same error occurs within the footnote below the Table listing Flow Cases.
- 10) Regarding Part I, Section A, the tables of constituents and associated limits should specify required analytical methods and whether metals analysis is total or dissolved.

Aethon appreciates your consideration of these comments to the draft permit. Responsible resource development can continue to coexist with carefully permitted authorizations that protect downstream designated uses. Aethon believes this draft permit has been structured with a thoughtful compliance and monitoring program that will achieve that balance.

Sincerely,

AETHON ENERGY OPERATING LLC

A handwritten signature in blue ink that reads "Andrea Taylor".

Andrea Taylor, PE
Regulatory & HSE Manager

Enclosure, Attachment 1

Attachment 1

Monthly DMR Data (Nov 2010 - Apr 2019)

		avg TDS	avg MGM	# of TDS samples	avg Chloride	# of Chloride samples		
Untreated Produced Water (Values until Aug 2015)	Outfall 001	7,291	27.90	58	2,539	9	6,812 avg untreated TDS (flow weighted)	2,472 avg untreated Chloride (flow weighted)
	Outfall 003	6,046	3.80	58	2,151	15	6,504 avg untreated TDS (not flow weighted)	2,419 avg untreated Chloride (not flow weighted)
	Outfall 006	6,250	7.28	58	2,048	15	49.06 MGM average discharge	
							506	
							1,394	
Outfall removed from service Apr 2012	Outfall 009	6,335	9.09	58	2,871	15	1.64 MGD average discharge	38,937 bbl/day
Outfall removed from service Jul 2011	Outfall 010	6,744	0.29	18	3,425	3		
Outfall removed from service Mar 2012	Outfall 011	6,244	0.38	9	1,600	1		
	Outfall 012	6,253	3.20	17	2,113	3		
With Neptune Treatment Dilution (Values since Sep 2015)	Outfall 001	2,850	25.70	34	1,563	8	4,224 avg TDS w/ Neptune dilution (flow weighted)	1,765 avg Chloride w/ Neptune dilution (flow weighted)
	Outfall 003	5,884	3.57	34	2,000	8	5,202 avg TDS w/ Neptune dilution (not flow weighted)	1,918 avg Chloride w/ Neptune dilution (not flow weighted)
	Outfall 006	6,137	9.74	34	1,973	8	45.27 MGM average discharge w/ Neptune	
	Outfall 009	5,935	6.27	34	2,139	8	1.51 MGD average discharge w/ Neptune	35,933 bbl/day

Attachment 1

		AVERAGE-NO NEPTUNE	AVERAGE W/ NEPTUNE	11/30/10	12/27/10	01/05/11	02/01/11	03/02/11	04/01/11	05/02/11
Oufall (Pit #)	TDS	6,504	5,202	6,686	6,457	6,229	5,914	6,129	5,914	6,114
	Chloride	2,419	1,918	2,171	2,171	2,171	2,171	2,171	2,171	2,171
	FLOW (BPM)	1,168,118	1,077,975			2,017,219	1,613,519	1,722,611	1,733,319	1,952,665
	FLOW (MGM)	49.06	45.27			84.72	67.77	72.35	72.80	82.01
	Chloride load (TPM)	495	362			767	614	655	659	743
	TDS load (TPM)	1,331	982			2,201	1,671	1,849	1,795	2,091
	BPD					715	715	715	715	715
001 (# 10)	TDS load (TPM)					67,241	53,784	57,420	57,777	65,089
	TDS	mg/L	7,291	2,850	7,200	7,200	7,000	6,600	7,100	6,500
	chloride	mg/L	2,539	1,563			2,700	2,700	2,700	2,700
	FLOW (BPM)		664,329	611,921			1,084,724	873,603	961,390	963,625
003 (# 5)	FLOW (MGM)		27.90	25.70			45.56	36.69	40.38	40.47
	TDS load (TPM)					125	76	87	97	111
	TDS	mg/L	6,046	5,884	6,000	5,900	5,800	5,500	5,600	5,500
	chloride	mg/L	2,151	2,000			1900	1900	1,900	1,900
	FLOW (BWM)		90,418	84,944			122,662	79,254	88,733	101,115
006 (# 6)	FLOW (MGM)		3.80	3.57			5.15	3.33	3.73	4.25
	TDS load (TPM)					227	144	166	176	206
	TDS	mg/L	6,250	6,137	6,500	6,400	6,200	5,700	6,000	5,700
	chloride	mg/L	2,048	1,973			1,800	1,800	1,800	1,800
	FLOW (BWM)		173,444	231,824			208,594	144,743	157,955	176,503
009 (# 7)	FLOW (MGM)		7.28	9.74			8.76	6.08	6.63	7.41
	TDS load (TPM)					523	430	443	405	405
	TDS	mg/L	6,335	5,935	6,300	6,100	6,100	5,600	6,000	5,700
	chloride	mg/L	2,871	2,139			2,100	2,100	2,100	2,100
	FLOW (BWM)		216,462	149,286			489,651	438,875	421,360	406,034
010 (# 16)	FLOW (MGM)		9.09	6.27			20.57	18.43	17.70	17.05
	TDS load (TPM)					10	11	6	6	8
	TDS	mg/L	6,744		6,800	6,600	6,500	6,000	6,300	6,700
	chloride	mg/L	3,425				3300	3300	3,300	3,300
	FLOW (BWPM)		6,804				9,086	10,407	5,643	5,434
011 (# 17)	FLOW (MGPM)		0.29				0.38	0.44	0.24	0.23
	TDS load (TPM)					11	8	8	8	12
	TDS	mg/L	6,244		6,800	6,400	5,500	5,900	6,000	5,500
	chloride	mg/L	1,600				1600	1600	1,600	1,600
	FLOW (BWPM)		9,068				11,734	8,083	7,642	8,627
012 (# 15)	FLOW (MGPM)		0.38				0.49	0.34	0.32	0.36
	TDS load (TPM)					103	63	83	73	88
	TDS	mg/L	6,253		7,200	6,600	6,500	6,100	5,900	5,800
	chloride	mg/L	2,113				1800	1800	1,800	1,800
	FLOW (BWPM)		76,113				90,768	58,554	79,888	71,981
	FLOW (MGPM)		3.20				3.81	2.46	3.36	3.02

Attachment 1

06/01/11	07/01/11	08/01/11	09/01/11	10/03/11	11/01/11	12/01/11	01/03/12	02/01/12	03/01/12	04/02/12	05/01/12
6,586	6,700	6,733	6,283	6,533	6,467	6,067	6,400	6,150	6,283	6,360	6,713
2,171	2,171	2,171	2,800	2,800	2,800	2,800	2,800	2,800	2,550	2,550	2,550
1,839,166	1,588,047	1,884,659	1,911,418	1,922,915	1,761,079	1,644,121	1,867,229	1,659,646	1,601,787	1,571,011	1,482,275
77.24	66.70	79.16	80.28	80.76	73.97	69.05	78.42	69.71	67.28	65.98	62.26
699	604	717	937	943	864	806	916	814	715	702	662
2,121	1,863	2,223	2,103	2,200	1,995	1,747	2,093	1,788	1,763	1,750	1,743
715											
61,306	52,935	62,822	63,714	64,097	58,703	54,804	62,241	55,322	53,393	52,367	49,409
1325	1314	1571	1482	1500	1286	1214	1419	1149	1145	1208	1207
7,100	7,400	7,500	7,100	7,600	7,300	7,300	7,300	6,800	7,200	7,600	8,050
2,700	2,700	2,700	3,000	3,000	3,000	3,000	3,000	3,000	2,800	2,800	2,800
1,065,231	1,014,031	1,195,724	1,191,795	1,126,822	1,005,533	949,814	1,109,726	964,414	908,389	907,382	856,228
44.74	42.59	50.22	50.06	47.33	42.23	39.89	46.61	40.51	38.15	38.11	35.96
132	79	158	142	165	178	151	153	124	130	135	147
6,100	5,900	6,100	5,700	5,900	5,900	5,500	6,000	5,800	5,700	6,000	6,700
1,900	1,900	1,900	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
123,688	76,298	147,707	142,507	159,765	171,818	157,266	145,605	121,579	129,985	128,634	124,951
5.19	3.20	6.20	5.99	6.71	7.22	6.61	6.12	5.11	5.46	5.40	5.25
134	147	156	153	186	172	141	163	164	189	184	172
6,600	6,300	6,200	5,600	6,300	6,100	5,600	6,100	6,000	6,300	6,100	6,100
1,800	1,800	1,800	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300	2,300
116,345	132,910	144,042	155,517	168,951	161,063	144,099	152,265	155,794	170,952	172,414	161,376
4.89	5.58	6.05	6.53	7.10	6.76	6.05	6.40	6.54	7.18	7.24	6.78
416	341	363	333	372	345	324	381	332	397	384	357
6,300	6,000	6,200	5,800	6,000	5,900	5,800	5,900	5,700	6,400	6,100	6,000
2,100	2,100	2,100	2,700	2,700	2,700	2,700	2,700	2,700	2,600	2,600	2,600
377,315	324,242	334,457	327,655	353,721	333,437	318,615	368,368	332,407	354,438	358,997	339,720
15.85	13.62	14.05	13.76	14.86	14.00	13.38	15.47	13.96	14.89	15.08	14.27
8	4	10	9	19	10	5	3	4	12	4	
6,800	7,300	7,600	7,300	7,200	7,300	6,600	6,700	6,600	6,600	6,000	
3300	3300	3300	3800	3800	3800	3800	3800	3800	2800	2800	
6,945	3,381	7,292	6,915	15,074	8,102	4,656	2,315	3,259	10,164	3,584	
0.29	0.14	0.31	0.29	0.63	0.34	0.20	0.10	0.14	0.43	0.15	
15	4										
6,700	7,700										
1600	1600										
12,820	2,934										
0.54	0.12										
156	38	66	95	107	90	68	100	86	27		
6,500	6,300	6,800	6,200	6,200	6,300	5,600	6,400	6,000	5,500		
1800	1800	1800	2500	2500	2500	2500	2500	2500	2300		
136,822	34,251	55,437	87,029	98,582	81,126	69,671	88,950	82,193	27,859		
5.75	1.44	2.33	3.66	4.14	3.41	2.93	3.74	3.45	1.17		

Attachment 1

06/01/12	07/02/12	08/01/12	08/31/12	10/01/12	11/01/12	12/03/12	01/02/13	02/04/13	03/01/13	4/1/2013	05/01/13	06/03/13
6,000	6,500	6,275	5,775	6,225	6,200	6,325	5,975	6,488	6,700	6,500	6,800	6,775
2,550	2,550	2,550	2,900	2,900	2,900	2,900	2,900	2,900	2,600	2,600	2,600	2,600
1,522,599	1,632,650	1,640,918	1,548,285	1,607,916	1,531,467	1,517,514	839,457	735,355	711,395	744,809	718,369	706,072
63.95	68.57	68.92	65.03	67.53	64.32	63.74	35.26	30.88	29.88	31.28	30.17	29.66
680	729	733	786	817	778	771	426	373	324	339	327	322
1,600	1,859	1,803	1,566	1,753	1,663	1,681	878	836	835	848	856	838
715	715	715	715	715	715	715						
50,753	54,422	54,697	51,610	53,597	51,049	50,584	27,982	24,512	23,713	24,827	23,946	23,536
966	1347	1302	1075	1195	1078	1077	567	606	569	549	490	528
6,500	7,600	7,400	6,900	7,600	7,500	7,400	6,200	7,550	7,900	7,500	7,700	8,100
2,800	2,800	2,800	2,300	2,300	2,300	2,300	2,300	2,300	2,800	2,800	2,800	2,800
848,130	1,011,996	1,004,658	889,538	898,064	820,676	831,122	521,741	458,197	411,457	418,170	363,606	371,988
35.62	42.50	42.20	37.36	37.72	34.47	34.91	21.91	19.24	17.28	17.56	15.27	15.62
131	139	127	121	119	139	150	79	70	65	57	65	65
5,600	6,000	5,700	5,400	5,400	5,600	5,900	5,900	6,100	5,900	6,100	6,400	6,400
2,500	2,500	2,500	2,000	2,000	2,000	2,000	2,000	2,000	2,400	2,400	2,400	2,400
133,321	132,242	127,586	128,370	125,852	141,745	145,090	76,777	65,247	63,286	53,619	58,267	57,822
5.60	5.55	5.36	5.39	5.29	5.95	6.09	3.22	2.74	2.66	2.25	2.45	2.43
222	228	216	239	282	282	284	163	146	170	196	226	208
5,900	6,200	5,900	5,600	5,900	5,800	6,000	6,100	6,200	6,500	6,000	6,600	6,300
2,300	2,300	2,300	2,100	2,100	2,100	2,100	2,100	2,100	2,300	2,300	2,300	2,300
215,104	209,996	209,344	243,598	272,958	277,707	269,874	152,409	134,008	149,767	186,291	195,559	188,680
9.03	8.82	8.79	10.23	11.46	11.66	11.33	6.40	5.63	6.29	7.82	8.21	7.92
343	302	320	261	327	301	285	88	83	99	97	115	97
6,000	6,200	6,100	5,200	6,000	5,900	6,000	5,700	6,100	6,500	6,400	6,500	6,300
2,600	2,600	2,600	5,200	5,200	5,200	5,200	5,200	5,200	2,900	2,900	2,900	2,900
326,044	278,416	299,330	286,779	311,042	291,339	271,428	88,530	77,903	86,885	86,729	100,937	87,582
13.69	11.69	12.57	12.04	13.06	12.24	11.40	3.72	3.27	3.65	3.64	4.24	3.68

Attachment 1

07/01/13	08/01/13	09/03/13	10/01/13	11/01/13	12/02/13	01/03/14	02/03/14	03/03/14	04/02/14	05/01/14	06/02/14	07/01/14	08/04/14	09/04/14
6,994	6,733	6,935	6,325	6,523	6,688	6,333	6,900	6,583	6,423	6,818	6,913	6,525	7,618	6,875
2,600	2,600	2,208	2,208	2,208	2,208	2,208	2,208	2,235	2,235	2,235	2,235	2,235	2,235	2,320
693,191	719,779	650,072	748,496	736,711	726,664	766,816	716,154	760,477	765,652	727,210	719,361	757,951	649,936	723,378
29.11	30.23	27.30	31.44	30.94	30.52	32.21	30.08	31.94	32.16	30.54	30.21	31.83	27.30	30.38
316	328	251	289	285	281	296	277	298	300	285	282	297	254	294
849	849	790	829	842	851	850	865	877	861	868	871	866	867	871
715														
23,106	23,993	21,669	24,950	24,557	24,222	25,561	23,872	25,349	25,522	24,240	23,979	25,265	21,665	24,113
515	496	413	510	529	558	553	511	541	490	480	534	489	502	534
8,170	7,970	6,500	7,220	7,640	7,400	7,220	7,290	7,080	7,230	7,190	7,350	7,100	8,155	7,240
2,800	2,800	2,340	2,340	2,340	2,340	2,340	2,340	2,410	2,410	2,410	2,410	2,410	2,410	2,290
359,707	355,453	362,470	403,334	395,696	430,400	437,408	399,961	436,194	386,985	381,215	414,692	393,394	351,786	421,308
15.11	14.93	15.22	16.94	16.62	18.08	18.37	16.80	18.32	16.25	16.01	17.42	16.52	14.78	17.69
70	67	54	68	58	51	61	51	60	94	54	60	53	53	47
6,750	6,490	6,710	6,170	6,230	6,390	5,950	6,300	6,210	6,270	6,340	6,500	5,860	6900	6250
2,400	2,400	2,170	2,170	2,170	2,170	2,170	2,170	2,020	2,020	2,020	2,020	2,020	2,020	2,010
59,042	58,734	45,549	62,998	53,246	45,301	58,421	46,671	55,421	85,238	48,301	52,619	51,621	43,582	42,824
2.48	2.47	1.91	2.65	2.24	1.90	2.45	1.96	2.33	3.58	2.03	2.21	2.17	1.83	1.80
226	229	191	226	203	209	147	160	181	175	167	165	190	160	178
6,680	6,180	6,410	5,960	6,020	6,840	6,070	6,480	6,140	6,230	6,380	6,550	6,430	7,435	6,970
2,300	2,300	1,940	1,940	1,940	1,940	1,940	1,940	1,800	1,800	1,800	1,800	1,800	1,800	2,090
193,044	211,741	169,794	216,636	192,999	174,879	138,220	141,191	168,454	160,828	149,095	143,962	168,574	122,582	145,425
8.11	8.89	7.13	9.10	8.11	7.34	5.81	5.93	7.08	6.75	6.26	6.05	7.08	5.15	6.11
91	103	103	68	103	82	142	169	121	138	192	137	170	184	140
6,375	6,290	8,120	5,950	6,200	6,120	6,090	7,530	6,900	5,960	7,360	7,250	6,710	7,980	7,040
2,900	2,900	2,380	2,380	2,380	2,380	2,380	2,380	2,710	2,710	2,710	2,710	2,710	2,710	2,890
81,398	93,851	72,259	65,528	94,770	76,084	132,767	128,331	100,408	132,601	148,599	108,088	144,362	131,986	113,821
3.42	3.94	3.03	2.75	3.98	3.20	5.58	5.39	4.22	5.57	6.24	4.54	6.06	5.54	4.78

Attachment 1

10/2/2011	11/03/14	12/01/14	01/05/15	02/02/15	03/02/15	04/01/15	05/01/15	06/01/15	07/01/15	08/03/15	09/02/15	10/01/15	11/02/15
6,753	6,705	6,563	6,713	6,570	6,133	6,658	6,755	6,813	6,710	6,440	5,374	4,886	4,878
2,320	2,320	2,320	2,320	2,320	2,150	2,150	2,150	2,150	2,150	2,150	2,193	2,193	2,193
735,569	741,865	744,261	741,783	748,521	791,475	750,440	1,094,107	1,017,853	1,037,583	919,789	1,055,612	1,208,842	1,160,308
30.89	31.16	31.26	31.15	31.44	33.24	31.52	45.95	42.75	43.58	38.63	44.34	50.77	48.73
299	301	302	301	304	298	283	412	383	391	346	405	464	446
870	871	855	872	861	850	875	1,294	1,214	1,219	1,037	994	1,034	991
715	715	715	715	715	715	715							
24,519	24,729	24,809	24,726	24,951	26,383	25,015	36,470	33,928	34,586	30,660	35,187	40,295	38,677
511	514	527	526	491	519	509	842	718	651	664	316	55	142
7,260	7,240	7,180	7,240	7,120	7,140	7,230	7,320	7,300	7,230	7,460	2,838	423	1,110
2,290	2,290	2,290	2,290	2,290	2,160	2,160	2,160	2,160	2,160	2,160	2,090	2,090	2,090
401,817	405,568	418,988	415,084	393,796	415,350	402,185	656,755	561,635	514,380	508,347	636,649	745,345	729,449
16.88	17.03	17.60	17.43	16.54	17.44	16.89	27.58	23.59	21.60	21.35	26.74	31.30	30.64
52	72	50	57	88	85	88	96	88	109	90	103	99	96
6160	6180	5980	6190	6070	5590	6,160	6,260	6,420	6,520	6,100	6,060	6,260	6,000
2,010	2,010	2,010	2,010	2,010	1,940	1,940	1,940	1,940	1,940	1,940	2,190	2,190	2,190
48,409	66,484	47,688	52,640	82,749	87,187	81,556	87,324	78,496	95,563	84,066	96,882	90,487	91,831
2.03	2.79	2.00	2.21	3.48	3.66	3.43	3.67	3.30	4.01	3.53	4.07	3.80	3.86
178	168	163	169	166	154	165	205	192	234	229	277	319	279
6,560	6,340	6,410	6,560	6,510	5,690	6,550	6,680	6,770	6,640	6,230	6,380	6,550	6,240
2,090	2,090	2,090	2,090	2,090	1,880	1,880	1,880	1,880	1,880	2,110	2,110	2,110	2,110
154,639	151,165	145,427	147,178	145,891	155,020	143,677	175,226	162,056	201,277	209,448	247,672	278,023	255,050
6.49	6.35	6.11	6.18	6.13	6.51	6.03	7.36	6.81	8.45	8.80	10.40	11.68	10.71
161	147	155	152	145	143	144	207	255	256	123	81	105	91
7,030	7,060	6,680	6,860	6,580	6,110	6,690	6,760	6,760	6,450	5,970	6,220	6,310	6,160
2,890	2,890	2,890	2,890	2,890	2,620	2,620	2,620	2,620	2,620	2,620	2,380	2,380	2,380
130,704	118,648	132,158	126,881	126,085	133,918	123,022	174,802	215,666	226,363	117,928	74,409	94,987	83,978
5.49	4.98	5.55	5.33	5.30	5.62	5.17	7.34	9.06	9.51	4.95	3.13	3.99	3.53

Attachment 1

12/02/15	01/14/16	02/03/16	03/02/16	04/04/16	05/02/16	06/01/16	07/01/16	08/02/16	09/01/16	10/07/16	11/01/16	12/01/16
5,210	4,868	4,703	5,421	5,390	5,347	5,580	5,440	5,593	5,348	5,481	5,547	5,588
2,193	2,193	2,193	1,670	1,670	1,670	1,670	1,670	1,670	1,983	1,983	1,983	1,983
1,109,067	1,100,174	1,019,507	1,090,693	1,053,183	1,060,806	972,322	1,016,690	1,046,553	1,025,223	878,679	892,355	991,948
46.58	46.21	42.82	45.81	44.23	44.55	40.84	42.70	43.96	43.06	36.90	37.48	41.66
426	422	391	319	308	310	284	297	306	356	305	310	344
1,012	938	840	1,036	994	993	950	969	1,025	960	843	867	971
715	715	715	715	715	715	715	715	715	715	715	715	715
36,969	36,672	33,984	36,356	35,106	35,360	32,411	33,890	34,885	34,174	29,289	29,745	33,065
345	190	138	472	424	436	432	438	452	398	336	339	401
2,980	1,610	1,190	3,636	3,329	3,598	3,678	3,672	3,660	3,512	3,894	3,717	4,132
2,090	2,090	2,090	431	431	431	431	431	431	1,970	1,970	1,970	1,970
660,440	673,467	663,910	740,956	726,642	692,426	671,058	681,724	705,298	647,426	492,681	521,327	553,492
27.74	28.29	27.88	31.12	30.52	29.08	28.18	28.63	29.62	27.19	20.69	21.90	23.25
89	87	82	90	83	87	76	74	66	62	59	89	130
5,900	5,830	5,730	5,890	5,950	5,780	6,040	5,860	5,910	5,900	5,750	5,950	6,110
2,190	2,190	2,190	2,060	2,060	2,060	2,060	2,060	2,060	1,990	1,990	1,990	1,990
86,056	84,824	81,852	86,858	79,779	85,683	71,813	72,455	63,832	60,372	58,709	85,027	121,653
3.61	3.56	3.44	3.65	3.35	3.60	3.02	3.04	2.68	2.54	2.47	3.57	5.11
301	277	228	271	254	267	240	252	261	261	294	269	273
6,150	6,170	6,060	6,310	6,280	6,270	6,400	6,110	6,280	6,050	6,160	5,960	6,040
2,110	2,110	2,110	2,050	2,050	2,050	2,050	2,050	2,050	1,930	1,930	1,930	1,930
279,122	256,241	214,489	244,871	230,914	242,844	214,242	235,795	237,672	245,909	272,115	257,226	258,235
11.72	10.76	9.01	10.28	9.70	10.20	9.00	9.90	9.98	10.33	11.43	10.80	10.85
85	88	61	18	17	40	17	29	45	74	59	33	62
5,810	5,860	5,830	5,850	6,000	5,740	6,200	6,120	6,520	5,930	6,120	6,560	6,069
2,380	2,380	2,380	2,140	2,140	2,140	2,140	2,140	2,140	2,040	2,040	2,040	2,040
83,449	85,642	59,256	18,008	15,848	39,853	15,209	26,716	39,751	71,516	55,174	28,775	58,568
3.50	3.60	2.49	0.76	0.67	1.67	0.64	1.12	1.67	3.00	2.32	1.21	2.46

Attachment 1

01/03/17	02/01/17	03/02/17	04/06/17	05/02/17	06/01/17	07/06/17	08/01/17	09/01/17	10/03/17	11/02/17	12/05/17	01/03/18
5,479	5,198	5,295	5,345	5,404	5,433	5,460	5,256	5,263	5,041	5,418	5,141	5,158
1,983	1,983	1,855	1,855	1,855	1,855	1,855	1,855	1,965	1,965	1,965	1,965	1,965
968,473	802,262	1,070,271	990,130	904,033	1,005,004	1,037,438	1,055,485	1,039,681	1,045,075	1,062,953	1,056,873	1,175,583
40.68	33.70	44.95	41.59	37.97	42.21	43.57	44.33	43.67	43.89	44.64	44.39	49.37
336	279	348	322	294	327	337	343	358	360	366	364	405
929	730	993	927	856	956	992	972	958	923	1,009	952	1,062
715	715	715	715	715	715	715	715	715	715	715	715	715
32,282	26,742	35,676	33,004	30,134	33,500	34,581	35,183	34,656	34,836	35,432	35,229	39,186
364	202	398	379	302	315	330	268	265	223	375	282	410
4,085	2,750	3,592	3,640	3,897	3,912	3,630	3,105	3,014	2,724	3,850	2,855	2,820
1,970	1,970	1,950	1,950	1,950	1,950	1,950	1,950	1,910	1,910	1,910	1,910	1,910
508,143	418,455	633,243	595,222	442,054	459,593	519,005	493,175	502,366	467,724	555,764	563,129	830,529
21.34	17.58	26.60	25.00	18.57	19.30	21.80	20.71	21.10	19.64	23.34	23.65	34.88
130	88	112	106	105	105	110	112	97	102	109	55	35
5,870	5,900	5,820	5,830	5,790	5,850	5,790	5,770	5,860	5,810	5,650	5,830	5,780
1,990	1,990	1,780	1,780	1,780	1,780	1,780	1,780	1,950	1,950	1,950	1,950	1,950
126,226	84,830	109,846	104,205	103,387	102,554	108,471	111,076	94,912	100,290	110,313	53,503	34,682
5.30	3.56	4.61	4.38	4.34	4.31	4.56	4.67	3.99	4.21	4.63	2.25	1.46
289	269	273	261	255	258	274	279	261	255	203	227	234
5,970	6,190	5,940	6,020	5,940	6,030	6,000	6,080	6,070	6,060	5,930	5,930	6,120
1,930	1,930	1,840	1,840	1,840	1,840	1,840	1,840	1,930	1,930	1,930	1,930	1,930
276,599	248,534	261,954	247,618	244,796	244,552	260,589	262,406	245,386	239,956	195,397	218,609	217,847
11.62	10.44	11.00	10.40	10.28	10.27	10.94	11.02	10.31	10.08	8.21	9.18	9.15
60	53	67	44	119	206	168	201	211	231	220	231	96
5,990	5,950	5,830	5,890	5,990	5,940	6,420	6,070	6,110	5,570	6,240	5,950	5,910
2,040	2,040	1,850	1,850	1,850	1,850	1,850	1,850	2,070	2,070	2,070	2,070	2,070
57,505	50,443	65,228	43,085	113,796	198,305	149,373	188,828	197,017	237,105	201,479	221,632	92,525
2.42	2.12	2.74	1.81	4.78	8.33	6.27	7.93	8.27	9.96	8.46	9.31	3.89

Attachment 1

02/01/18	03/02/18	04/03/18	05/01/18	06/04/18	07/02/18	08/01/18	09/04/18	10/02/18	11/01/18	12/04/18	01/02/19
5,090	5,479	4,854	4,745	4,649	4,958	4,983	5,116	5,073	5,070	5,109	5,168
1,965	2,128	2,128	2,128	2,128	2,128	2,128	1617	1617	1617	1617	1617
1,245,254	1,552,565	1,314,333	1,268,132	1,191,315	1,288,150	1,253,901	1,202,327	1,203,367	1,068,659	1,155,688	980,808
52.30	65.21	55.20	53.26	50.04	54.10	52.66	50.50	50.54	44.88	48.54	41.19
429	579	490	473	444	480	467	341	341	303	327	278
1,110	1,490	1,117	1,054	970	1,119	1,094	1,077	1,069	949	1,034	888
715	715										
41,508	51,752	43,811	42,271	39,711	42,938	41,797	40,078	40,112	35,622	38,523	32,694
332	545	141	61	41	184	158	191	189	187	213	257
2,691	3,928	1,247	558	384	1,692	1,464	1,884	1,891	1,991	2,218	2,422
1,910	2,210	2,210	2,210	2,210	2,210	2,210	218	218	218	218	218
705,223	791,812	645,322	628,538	615,152	619,674	615,528	578,673	571,149	536,815	549,261	605,955
29.62	33.26	27.10	26.40	25.84	26.03	25.85	24.30	23.99	22.55	23.07	25.45
76	142	77	89	65	89	83	90	65	40	57	91
5,850	5,940	5,870	5,880	5,790	5,920	5,960	5,990	6,000	5,860	5,920	5,890
1,950	2,050	2,050	2,050	2,050	2,050	2,050	2,010	2,010	2,010	2,010	2,010
74,048	136,130	74,488	86,399	64,115	85,904	79,562	86,017	61,835	39,240	55,125	88,512
3.11	5.72	3.13	3.63	2.69	4	3	4	3	2	2	4
244	250	252	231	152	237	200	206	236	172	233	234
6,120	5,980	6,160	6,090	6,180	6,240	6,300	6,240	6,150	6,260	6,130	6,210
1,930	2,000	2,000	2,000	2,000	2,000	2,000	1,960	1,960	1,960	1,960	1,960
227,457	239,146	233,640	216,127	140,715	217,270	181,353	188,405	218,975	156,932	217,252	214,887
9.55	10.04	9.81	9.08	5.91	9	8	8	9	7	9	9
238	410	388	381	406	383	411	388	385	363	361	77
5,700	6,070	6,140	6,450	6,240	5,980	6,210	6,350	6,250	6,170	6,170	6,150
2,070	2,250	2,250	2,250	2,250	2,250	2,250	2,280	2,280	2,280	2,280	2,280
238,526	385,477	360,883	337,068	371,333	365,302	377,458	349,232	351,408	335,672	334,050	71,454
10.02	16.19	15.16	14.16	15.60	15	16	15	15	14	14	3

Attachment 1

02/01/19 03/03/19 04/02/19

5,396	5,573	4,070
1617	1975	1975
994,291	878,305	938,584
41.76	36.89	39.42
282	304	325
940	857	669
715	715	715
33,143	29,277	31,286
418	427	525
3,442	4,183	4,582
218	2040	2040
694,166	582,212	654,338
29.15	24.45	27.48
88	84	78
5,900	5,890	5,760
2,010	1,900	1,900
85,047	81,331	77,368
4	3	3
213	232	210
6,170	6,170	5,940
1,960	1,940	1,940
197,065	214,762	201,612
8	9	8
19	0	0
6,070	6,050	0
2,280	2,020	2,020
18,013	0	5,266
1	0	0